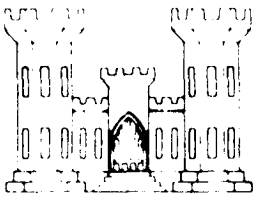

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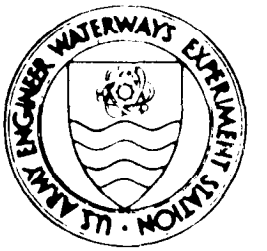

TECHNICAL REPORT D-78-25

HABITAT DEVELOPMENT FIELD INVESTIGATIONS, NOTT ISLAND UPLAND HABITAT DEVELOPMENT SITE, CONNECTICUT RIVER, CONNECTICUT

APPENDIX A: PRELIMINARY TERRESTRIAL ECOLOGICAL SURVEY

by

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July 1978

Final Report

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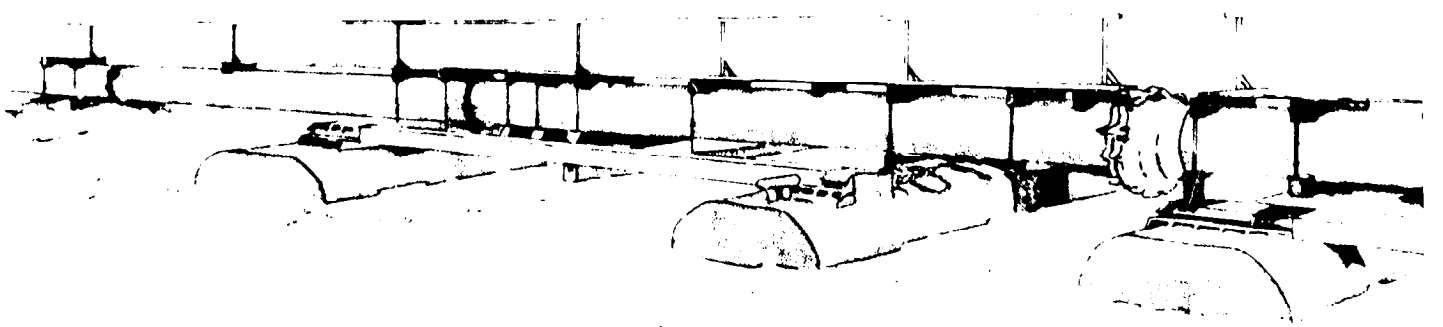

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HABITAT DEVELOPMENT FIELD INVESTIGATIONS, NOTT ISLAND UPLAND HABITAT DEVELOPMENT SITE, CONNECTICUT RIVER, CONNECTICUT

APPENDIX A: PRELIMINARY TERRESTRIAL ECOLOGICAL SURVEY

APPENDIX B: SURVEY OF TERRESTRIAL ECOLOGY AND PRELIMINARY BOTANICAL MONITORING

APPENDIX C: POSTPROPAGATION MONITORING OF VEGETATION AND WILDLIFE

REPORT DOCUMENTATION PAGE

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An ecological survey of terrestrial biotic resources was conducted in 1975 at Nott Island, Connecticut, prior to upland habitat development at that site. Nearly 200 species of plants were collected and identified. The major vegetation communities are: shrubland characterized by false indigo, goldenrod, and various grasses and sedges; grassland characterized by switchgrass, beachgrass, and reed grass; and estuarine wetlands characterized by cattails and reed grass. Eighteen species of mammals are expected to inhabit the study area, although sign of only nine was actually observed. Meadow (Continued)

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20. ABSTRACT (Continued).

voles and jumping mice appear particularly common. Birds were the most common vertebrates encountered at Nott Island. Sixty-one species of birds were observed, and the island provides potential habitat for about 180 species. Twenty-three species were found to be nesting on the island, the most common being red-winged blackbirds, song sparrows, and yellow warblers.

PREFACE

The work described in this report was performed under Contract No. DACW33-75-M-0059 between the U. S. Army Engineer Division, New England, and the University of Connecticut. The research was sponsored by the Dredged Material Research Program (DMRP), Environmental Laboratory (EL), Waterways Experiment Station (WES).

Authors of the report were Drs. R. Scott Warren and W. A. Niering of Connecticut College, New London, Connecticut. Substantial contributions were made by Gregory Butcher, Allen Carroll, Deborah Fuller, Penelope Howell, Robert McDowell, Timothy Reynolds, and Linda Staehley.

This report was prepared under the general supervision of Dr. John Harrison, Chief, EL, and Dr. C. J. Kirby, Chief, Environmental Resources Division, EL. Ms. L. Jean Hunt was contract manager. COL G. H. Hilt, CE, and COL J. L. Cannon, CE, were Commanders and Directors of WES during the period of study. Mr. F. R. Brown was Technical Director.

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CONVERSION FACTORS, U. S. CUSTOMARY TO METRIC (SI)
UNITS OF MEASUREMENT

U. S. customary units of measurement used in this report can be converted to metric (SI) units as follows:

Multiply	By	To Obtain
inches	2.54	centimetres
feet	0.3048	metres
yards	0.9144	metres
miles (U. S. statute)	1.6093	kilometres
acres	0.4046	hectares
square miles	2.5899	square kilometres

PART I: INTRODUCTION

1. The purpose of this study was to obtain baseline data on the terrestrial and wetland environments of the Nott Island Upland Habitat Development Site, Connecticut River, Connecticut, prior to development of upland habitat on the site.

Nott Island, about 77 acres in extent, is located in the Connecticut River seven miles north of Long Island Sound and east of the Town of Essex, Connecticut. This north-south elongated island was initially formed by periodic flooding and deposition of alluvial materials. The elevated topographic relief formed primarily of sand has resulted from the deposition of dredged material over the last half century. Southward, an extensive estuarine wetland has developed. The upland soils include fine alluvium overlain in certain areas by sandy, dredged material. Muck type soils characterize the estuarine wetlands.

2. Vegetationally, the area lies within the central hardwoods-hemlock (Westveld et al. 1956) or sprout hardwoods (Egler and Niering 1965) forest region. A diversity of oaks--red, white, scarlet and black--along with red maple and black birch typify the surrounding upland forest. Past cutting and agricultural activities have had a major impact on the vegetation. In general, the forests are immature and many are in a state of transition from agricultural abandonment to thicket or forest vegetation. Periodic hurricanes modify relatively mature forest stands by causing extensive blowdowns (Niering and Goodwin 1962).

3. Nott Island has been subjected to an agricultural land use which may well date back to 1674 when it was acquired by Richard Ely as Eight Mile Island. Since at least 1890 and probably longer, the island has been farmed and pastured. In 1925 it was covered primarily with grass on the uplands and wet meadow vegetation to the south which was apparently maintained by tidal gate manipulation. Various perturbations have impacted Nott Island through the years. For example, the island was flooded by a hurricane in 1938, grazed by cattle until 1948, partially burned in 1960, and has been used during at least three dredging operations for the deposition of dredged material (1930's, 1960 and

1975 operation). Although much of the dredged sand has been colonized by grassland or shrub communities, sizable areas of bare sand still persist. Currently the island serves as an open space and wildlife resource. Its wetland also contributes to the estuarine productivity of the surrounding waters.

4. In 1975 a portion of the northern end of Nott Island was designated to be an upland habitat development site. A seven-foot dike inclosing an eight-acre site was constructed from sandy deposits on the island and dredged material was hydraulically placed in this enclosure.

PART II: METHODS

Floristic Survey

5. The flora of the disposal site was initially inventoried during the winter of 1975 and twigs of woody specimens collected. During the summer of 1975, weekly collections of the vascular flora provided an opportunity to obtain specimens in flowering or fruiting condition. Specimens are on file in the Graves Herbarium at Connecticut College, New London.

Mammal, Reptile and Amphibian Survey

Pre-dredging fall survey - 1974

6. In the fall of 1974 (September 17-21), mammal trapping was carried out in an area of Nott Island encompassing 2.8 acres and including a part of the proposed disposal site. Forty-seven traps were used, giving a total of 235 trap nights. Traps were set in a grid with 50-foot intervals between traps (Coastal Zone Resources Corporation 1977).

Winter-spring survey - 1975

7. Presence data on the larger mammals and on the reptiles and amphibians were obtained by periodic walking reconnaissances initiated in February 1975. Initial observations for small mammals began at the same time, and in March, 52 snap and rat traps were set selectively around the outside of the newly constructed dikes (giving 52 trap nights). Traps were baited with peanut butter. On April 22, 61 traps were set out in two habitats (giving 61 trap nights). Forty-four were placed at 40-foot intervals, 10 feet from the outer base of the dikes, and 17 were placed in three vegetated areas within the diked area. Sherman Live Traps were used and baited with peanut butter.

Summer survey - 1975

8. Presence data collection on reptiles and amphibians continued during the summer of 1975. Intensive small mammal trapping was carried out from 30 May to 15 August 1975. Four study areas were established

(Figure 2). Area I included the sand-covered disposal site and its mixed grass-shrub periphery. Area II included the northern area dominated by mixed tree-shrub-grassland vegetation; while Areas III and IV included two false indigo and shrub-covered sections extending southward from the disposal site. In each study, large folding aluminum Sherman Live Traps, baited with peanut butter/oatmeal mixture, were used. Traps were laid out in a 15-m grid and set for four to six nights. In the disposal area traps were checked daily between 7-9 a.m. and 5-7 p.m. In all other areas traps were checked only between 7-9 a.m. The following numbers of trap nights were tallied for the various sites: Area I, 482; Area II, 756; Area III, 280; Area IV, 420.

9. Study skins were made of selected representatives of all species captured and are on file at Connecticut College, New London, Connecticut. Those animals not used for study skins were toe-clipped for identification purposes and released.

Bird Survey

10. A survey of the bird life of Nott Island included observations and notation of breeding and transient species of the island's wetland and upland communities. Nesting pairs and breeding bird density were noted.

PART III: DISCUSSION AND RESULTS

Terrestrial Ecology

Botany

11. Vascular flora. General surveys of the vascular plants of Nott Island were made prior to and after disposal in 1975. The first survey was conducted in the dormant season and consequently many species which were collected in the second survey (growing season) were not represented. Nearly 200 species were recorded.

12. Major plant communities. The uplands are dominated by a grassland-scrub-tree complex which has developed following abandonment of agriculture and previous dredged material disposal operations. The open nature of the plant cover in some areas has been accentuated by the xeric sandy substrate resulting from the deposition of dredged material. To the south an extensive marsh has developed between the two lobes of upland. The major vegetation types shown in Figure 1 were compiled on the basis of field reconnaissance and aerial photographs. Major cover types recognized include shrubland, mixed tree-shrubland, grassland and grass-shrubland. Recently disturbed and disposal site vegetation, as well as the estuarine wetlands, are also mapped. Specific floristic associations are indicated where possible. For the most part common names will be used in this text. Scientific names are given in Table 1.

13. Shrubland communities. One of the most widespread and conspicuous shrub communities is represented by false indigo, a clonal shrub forming relatively pure stands and reaching 6-10 ft in height. It occurs on relatively dry sandy sites, as well as on moist or wet alluvial sites. Usually a herbaceous stratum is present with goldenrod on the drier sites, grasses on the mesic and sedges in the wetter spots. This shrub is a characteristic species on alluvial soils along the Connecticut River and may have occupied an even larger part of the island prior to dredging. Although relatively pure stands occur over sizable stretches, trees, some quite large, occasionally penetrate the shrub continuum. A huge swamp white oak 42 inches in diameter occurs on the east central part of the island. Southward a large willow and sassafras also stand out

conspicuously above the shrubs. In some areas the development of tree and shrub growth probably occurred concomitantly resulting in a mixed tree-shrub type, as mapped. Among the more common trees encountered are cottonwood, tree of heaven, silver maple, American elm, red ash, catalpa, black cherry and red cedar. Shrubs frequently associated are bayberry, poison ivy, oriental bittersweet and several species of sumac. These tree-shrub associations are scattered but are best developed along the northwest side of the island. Occasionally the trees reach 50-60 ft in height and a foot or more in diameter. Vine and shrub cover varies in density and coverage depending upon light conditions.

14. Locally on the sandy dredged material, there have developed relatively pure stands of bayberry which appear to be relatively stable and are therefore of considerable ecological interest and demand further study in terms of vegetation dynamics (Niering and Goodwin 1974). The small localized alder thicket occurs in a wet pocket near a former homestead and represents the most mesic site on the northern part of the island.

15. Grassland communities. Two major upland grassland communities occupy nearly 50 percent of the north half of the island, excluding the disposal site. On the more level sandy sites switch grass, a tussock forming grass, comprises the characteristic vegetation. Its scattered clumps are interspersed with occasional forbs on exposed sandy soil. Scattered shrubs such as the clonal sumacs or occasional tree growth may be associated in some areas. The xeric nature of these grassy stands has not tended to favor woody establishment.

16. A second possibly more xeric grassland type is the beachgrass covering several elevated dunelike areas, especially on the west side of the island. A sizeable expanse also occurs just east of the disposal site. Essentially a monoculture, woody growth is rare or absent. These areas represent an excellent example of site stabilization.

17. Locally reed grass also forms scattered pure stands on the sandy deposits. However, it reaches its maximum development in the wetter sites around the cattail marsh.

18. Estuarine wetlands. The estuarine wetlands comprise an extensive marsh complex with a network of tidal creeks at the southern end of the island. The two dominant communities are narrow-leaf cattail and reed grass. The cattails form the continuous phase along the creeks in the wetter sites with the reed grass occurring in localized stands, often in the less hydric sites. The largest reed grass area occurs at the head of the wetland. The presence of tidal gates in the past apparently perpetuated a relatively open wet meadow vegetation in contrast to the flooded nature of much of the area, which is reflected in the cattails today. The presence of reed grass today may be correlated with this earlier disturbance. Islands of sedges also occur within the cattails, but are most extensive along the margins of the island. This far up the river the intertidal salt water cordgrass is extremely limited in its distribution. On shallow mud flats a mixed forb aquatic vegetation is characterized by a diversity of emergent forms.

19. Vegetation of the disposal site. Prior to construction and filling of the disposal area, four plant communities--switch grass, false indigo, black locust and reed grass--were recognized. Although a complete flora of the area was not possible during the dormant period, those plants recorded are indicated by an asterisk in the species list (Table 1).

20. Switch grass was the dominant vegetation covering an estimated 60-70 percent of the area. On the slightly undulating sandy substrate deposited by a previous dredging operation the scattered grass clumps formed an open cover with occasional lichens and scattered forbs such as sheep sorrel, goldenrod and evening primrose. Scattered trees including tree of heaven 18-25 ft in height, red ash 25 ft, black oak 35 ft, cedars and elms contributed less than 10 percent coverage within this grassland community. Associated shrubs were bayberry and sumac.

21. False indigo shrubland representing 10-20 percent of the area occurred along the east and south sides of the disposal area. It formed a relatively continuous cover with scattered trees and shrubs of the species previously mentioned. Switch grass or goldenrod formed the dominant ground cover on the sandy sites.

22. Black locust woodland near the west central sector of the area represented the most forested aspect. Trees 35-40 ft in height and 6-8 inches in diameter formed a relatively continuous but open canopy under which goldenrod persisted as a distinctive ground cover. The stand, probably of clonal origin, was cut and utilized prior to filling.

23. Reed grass occurred in a slight sandy depression probably resulting from deposition of the earlier dredged material. Although on a relatively dry site, the reed grass was vigorous, reaching 6 ft in height.

24. Since the dredging operation was not completed during the spring of 1975, not all of the original vegetation was obliterated. Two remnants of the switch grass and false indigo communities persisted as did much of the reed grass (Figure 1). The switch grass areas were especially vigorous, possibly favored by the excessively moist conditions produced by dredging. The reed grass was vigorous and sent out rhizomes along the surface of the sand for several yards. Where sand covered the pre-existing vegetation, a considerable resurge of the buried vegetation was evident (1-5 percent). Poison ivy, false indigo, ash, dogwood, and black locust were among the species present. Some die-back was evident by late summer. Among the more common annuals colonizing the exposed sand were barnyard grass, carpet weed, smart weed and sedges. Collectively these species contributed less than 1 percent cover. On the east side of the site where the finer silt deposits have accumulated, especially near the outfall pipe, sedges, rushes, spike rush and several other species, most annuals, locally contributed up to 50 percent cover.

Mammals

25. Small mammals: pre-dredging fall survey - 1974. The trapping of September 1974, which encompassed 2.8 acres of the proposed disposal site, yielded 73 meadow voles, 14 meadow jumping mice, two white-footed mice and one short-tailed shrew during 235 trap nights (Table 3).

26. Small mammals: winter-spring survey - 1975. The winter trapping (11 March) yielded two meadow voles and one white-footed mouse in 52 trap nights. Both were captured in panic grass cover. The spring trapping (22 April) yielded four meadow voles and one short-tailed shrew during the 61 trap nights. Three of the voles were captured in panic grass.

The shrew and the fourth vole were captured in the panic grass/reed grass patch inside the diked area. Walking tours of the island from 31 January through 14 May revealed vole activity throughout the grassy areas of the disposal site.

27. Small mammals: summer survey - 1975. During the summer trapping period (17 June-14 August) only three species, the meadow vole, meadow jumping mouse, and Norway rat were captured (Table 4). The dominant small mammal was the meadow vole. It reached its greatest abundance on the northern part of the island dominated by shrubby thickets, grassy openings, and scattered tree cover. It was also common in the dune grass and shrub-vine communities. The meadow jumping mouse was most frequent around the outside of the disposal site - a habitat which appears least favorable to voles. Elsewhere, however, the range of these two species overlapped considerably. At about 9 percent of the trapping stations both species were captured. The Norway rat, the least common small mammal, was captured four times.

28. As one might predict, no animals were captured on the bare sand within the disposal site. However, nine mole tunnels were recorded (20 June) extending from the dune grass area into the bare sand. This may have been the eastern mole, the most common mole in this area of Connecticut (Goodwin 1935).

29. In all three trapping periods, the most important species encountered was the meadow vole. This species was distributed throughout the island from open grasslands to shrubby woodlands. The presence of these animals in the latter areas is surprising since it is the white-footed mouse which is usually found in forest or shrub habitats (Hirth 1959, Pearson 1959, M'Closkey and Fieldwick 1975).

30. The important associated species, the meadow jumping mouse, overlaps its range with that of the vole, suggesting that the two species have rather similar habitat requirements. Quimby (1951) found the vole commonly associated with the meadow jumping mouse and suggested that moisture availability was more important than grass cover in the distribution of the meadow jumping mouse. Burt (1969) reported that these animals feed in low, moist sites but frequently have nests in higher,

drier areas. Both Quimby (1951) and Whitaker (1963) found the highest meadow jumping mouse populations in the more moist sites where the voles were also common. On Nott Island, the vole and meadow jumping mouse are also most frequently found in moist sites (grass-shrubland freshwater wetlands, North Area-Figure 1).

31. The nature of the plant cover is also important in the occurrence of the various species on Nott Island. Where herbaceous ground cover was moderate to heavy and undisturbed, percent capture of both voles and meadow jumping mice was relatively high, supporting the findings of Whitaker (1963) and Hodgson (1970). Hodgson (1970) found that voles preferred habitats with an least 85 percent herbaceous cover.

32. The increase in the ratio of meadow jumping mice to voles in the disturbed area around the outside of the dikes of the disposal site may be related to their feeding habits. Although primarily grazers, meadow jumping mice can become largely insectivorous when seeds and fruits are not available (Whitaker 1963). Meadow voles, on the other hand, are strictly herbivorous grazers.

33. The occurrence of the white-footed mouse in the initial sampling and not thereafter is of interest. It may reflect recent migration to the island and unsuccessful establishment, or high levels of predation since these animals, as climbers, tend to expose themselves to predators in such an open environment. Or these mice may simply have been missed in trapping.

34. Reasons for the presence of the short-tailed shrew during the initial fall and spring census and its absence during the intensive summer sampling are not clear. It is known to be intolerant of high temperatures (35° C or greater) (Neal and Lustick 1973). Temperatures exceeding this were recorded on all study sites during the summer of 1975. Yet there would seem to have been ample microsites suitable for this species within the sampling area.

35. The occurrence of the Norway rat during the summer, although unimportant at present, may increase in importance in the future, however, it is usually associated with human habitation and man's refuse (Goertz and Long 1973), which are non-existent on the island.

36. Evidence of larger mammals. Tracks and browse of white-tailed deer were common throughout the island. Many of the lower branches of the red cedar were conspicuously browsed, as were branches of false indigo and bittersweet vines. A doe and fawn were sighted in the grassland southeast of the disposal site (4 August 1975). A fawn was observed earlier (18 June 1975) in a rose thicket. The deer possibly migrate between the island and the adjacent mainland as they are good swimmers and are known to swim more than 10 kilometres (Schemnitz 1975).

37. Although muskrats and raccoons were not captured, their presence is indicated by tracks or reported sightings. Muskrat tracks were frequently seen along Nott Island's shore. Raccoons are commonly found in wetland areas such as the reed grass and cattail stands covering the south end of the island. The river otter is native to this area (Goodwin 1935, Burt and Grossenheider 1964), although it is relatively rare.

38. Other small mammals whose presence was not confirmed but which might be present are the long-tailed weasel, ermine, and the striped skunk. All are commonly found on wooded areas near water (Burt and Grossenheider 1964). The eastern cottontail rabbit and the opossum may be present on the island. Rabbits were sighted several times in the woodland on the adjacent mainland, and an opossum was seen nearby on the mainland. Blackberry, possibly browsed by rabbits, was seen on the east side of the island. The house mouse might be expected as it is often associated with the Norway rat (Goertz and Long 1973). The red fox is common to shrubs and wood areas (Burt 1969) and might be present on Nott Island. Mink are good swimmers and might be expected to easily colonize the island (Northcott et al. 1974).

Birds

39. Birds form the largest and most diverse group of vertebrates observed on Nott Island. Sixty-one species in total were observed, and twenty-three species were found nesting. Nott Island is believed to provide potential habitat for as many as 180 species of birds. A more detailed discussion of the avifaunal aspects of this site is found in Appendix A'.

Reptiles

40. Two species of snakes were seen on Nott Island during the summer of 1975. The eastern garter snake was sighted in the dune grass on the west side of the island in the summer of 1974 (Jean Hunt, personal communication) and in August 1975. Two black racers were seen in June 1975; one in the shrub area north of the disposal site and another in similar habitat to the west of the disposal site.

41. Diamondback terrapins and several common snapping turtles were observed during the summer (Allen Carroll, personal communication). Terrapin nests were seen in the sand adjacent to the reed grass (Jean Hunt, personal communication). A spotted turtle was tentatively identified near the eastern shore of the island (Gregory Butcher, personal communication).

42. Species of snakes that could be expected to be found on Nott Island, in addition to those seen there include the eastern hognose snake, which prefers sandy areas (Conant 1975), the northern water snake, the eastern worm snake, and the eastern ribbon snake. The water snake is relatively common, being found in most aquatic habitats (Conant 1975) and may be present in the wetlands here. Worm snakes are commonly found in mesic areas under rocks, boards, and debris (Conant 1975). The tidal debris strewn along all the margins of the island might harbor some of these snakes. The ribbon snake is usually found in streams, pools, and bogs (Conant 1975, Ditmars 1922). The eastern box turtle may also be present.

Amphibians

43. Two species of toads were seen on the island: the American toad in the shrub area just north of the northwest corner of the disposal site, and Fowler's toad in the panic grass area farther north of the disposal site.

44. Amphibians which might be found on Nott Island are the eastern spadefoot toad, which is common to dry, sandy areas (Conant 1975); the eastern tree frog; and the spring peeper. The habitat of the latter two species often overlaps (Conant 1975). Neither has been seen or heard on the island.

45. The mudpuppy could be present on Nott Island as it is common to almost any permanent body of water and feeds on virtually any small aquatic life (Conant 1975). All other species of salamanders common to southern Connecticut are essentially woodland and bog species (Conant 1975) and so would not be expected on Nott Island.

PART IV: PROBABLE ECOLOGICAL IMPACTS OF THE DISPOSAL SITE

46. The replacement of 6 acres of grass-shrub and woodland habitat with a bare expanse of exposed sand would obviously result in changes in the animal population and possibly some loss in floristic diversity on the island.

47. The loss of the switch grass community may have reduced or resulted in an expansion of the meadow vole into the surrounding thicket. Population replacement may account for the overlap of the meadow vole and meadow jumping mouse populations. The presence of the white-footed mouse and shrews prior to the disturbance and their absence thereafter may be related to the deposition of the dredged material. The reported absence of these two populations during the summer of 1975 demands further study. The black locust woodland may have provided microsites especially favorable to the shrews and white-footed mice.

48. The loss of shrubby cover would have also adversely affected the typical thicket-inhabiting birds such as the catbird, yellowthroat, yellow warbler, and song sparrow recorded nesting in the contiguous thicket.

49. Floristically, several vascular plant species that had become established on the island may have been eliminated. Seven species (5 woody and 2 herbaceous), not rare in the region, were not recorded elsewhere during the summer inventory. However, this does highlight the role of probability in the immigration of disseminules, establishment of seedlings and biotic, meteoric and edaphic factors (Egler 1942).

50. On the positive side, site disturbance favors certain species. A diversity of annual plants has appeared within and around the edge of the disposal site. One of these, barnyard grass, provided considerable food for the grazing Canada geese that frequented the site. The resurging and dying plant growth within the site may have favored soil insects that in turn favored the mole activity observed. Further observations will be necessary to fully document the biological effects of the disposal site.

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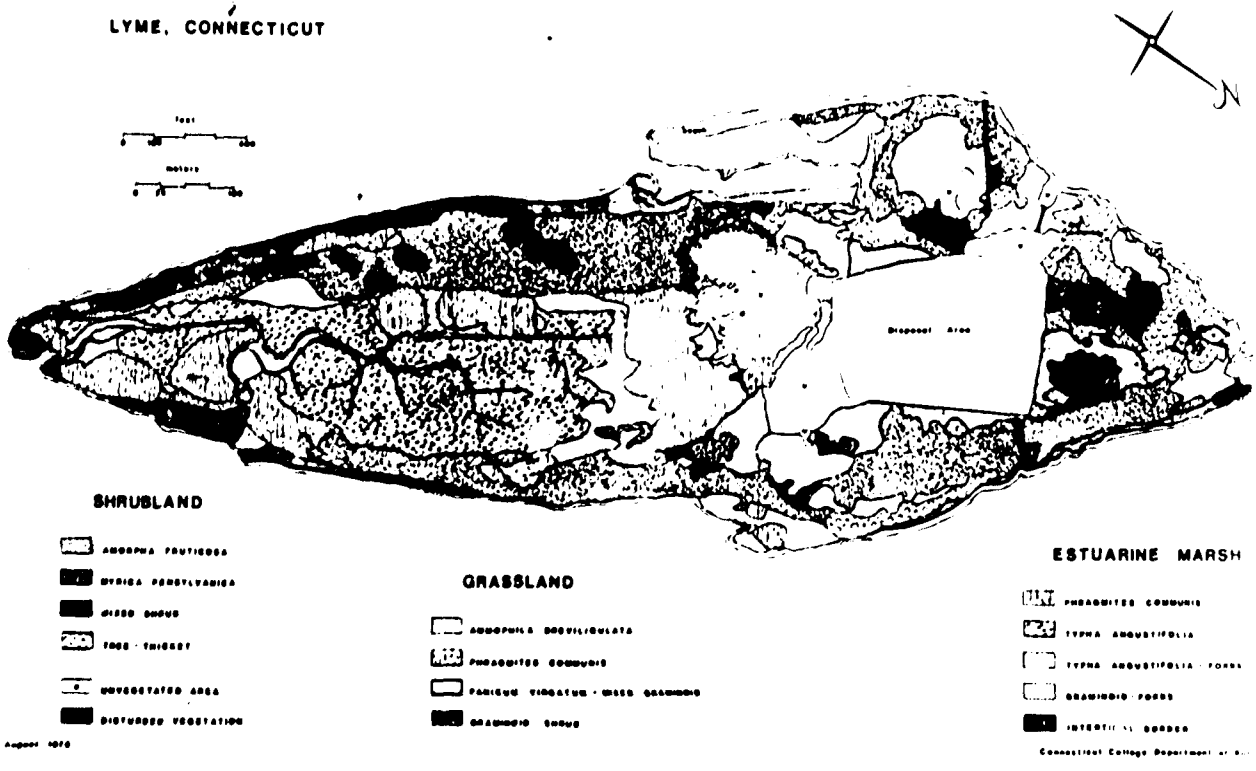

Figure 1. Vegetation Types

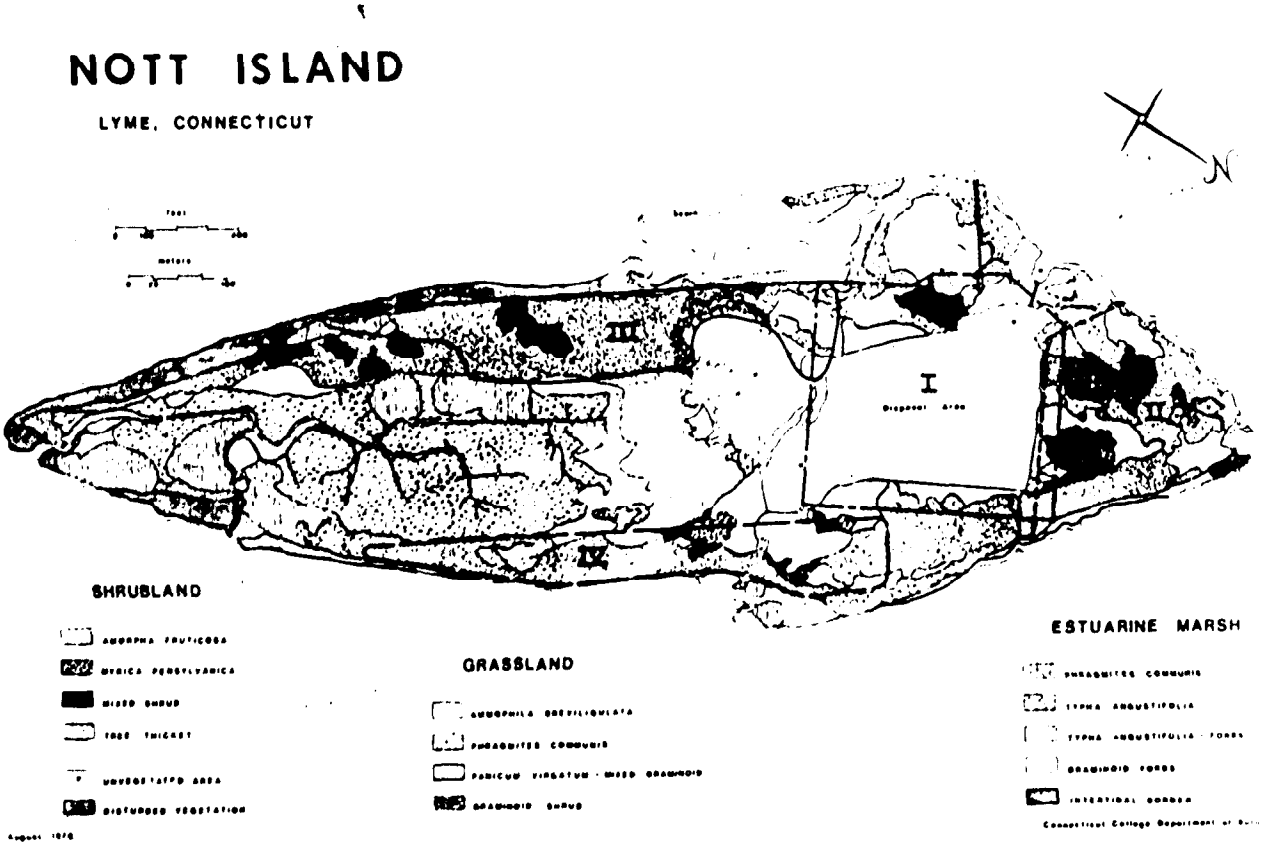

Figure 2. Trapping Areas

Table 1

Vascular Plants Found at
Nott Island in 1976

Common Name	Scientific Name
Alder	*Alnus serrulata*
*American elm	*Ulmus americana*
Barnyard grass	*Echinochloa crusgalli*
*Bayberry	*Myrica pensylvanica*
*Beachgrass	*Ammophila breviligulata*
Bedstraw	*Galium obtusum*
Beggar-ticks	*Bidens* sp.
Birds nest	*Brassica rapa*
*Blackberry	*Rubus allegheniensis*
Black-eyed susan	*Rudbeckia serotina*
Black gum	*Nyssa sylvatica*
*Black locust	*Robinia pseudoacacia*
*Black oak	*Quercus velutina*
Blue eyed grass	*Sisyrichium angustifolium*
Bluejoint grass	*Calamagrostis canadensis*
Blue vervain	*Verbena hastata*
Boneset	*Eupatorium perfoliatum*
Bouncing bet	*Saponaria officinalis*
Buckthorn	*Rhamnus cathartica*
Bulrush	*Scirpus atrovirens*
Bulrush, three square	*Scirpus americanus*
**bush-clover	*Lespedeza capitata*
Butter-and-eggs	*Linaria vulgaris*
**Button bush	*Cephalanthus occidentalis*
Canada lily	*Lilium canadense*
Carpetweed	*Mollugo verticillata*
Catalpa	*Catalpa speciosa*

* Indicates species found in first survey (dormant season)
** Indicates species found only on dredged material

Table 1 (Continued)

Common Name	Scientific Name
Chickweed	Stellaria aquatica
Choke cherry	Prunus virginiana
Clearweed	Pilea pumila
Common barberry	Berberis vulgaris
Common bluets	Houstonia caerulea
*Common evening primrose	Oenothera sp.
Common milkweed	Asclepias syriaca
Common mullein	Verbascum thapsus
Common nightshade	Solanum nigrum
Cordgrass	Spartina cynosuroides
*Cottonwood	Populus deltoides
Cudweed	Gnaphalium uliginosum
Cut grass	Leersia oryzoides
Cypress spurge	Euphorbia cyparissias
Dandelion	Taraxacum officinale
Dayflower	Commelina communis
*Dewberry	Rubus flagellaris
Dodder	Cuscuta sp.
Dwarf dandelion	Krigia virginica
Elderberry	Sambucus canadensis
Eyebane	Euphorbia maculata
Fall witch grass	Leptoloma cognatum
*False indigo	Amorpha fruticosa
False nettle	Boehmeria cylindrica
False pimpernel	Lindernia anagallidea
Fescue	Festuca octifolia
Field mint	Mentha arvensis
Field sandbur	Cenchrus tribuloides
Figwort	Scrophularia lanceolata
Flat-topped goldenrod	Solidago graminifolia
Fox grape	Vitis labrusca

(Continued)

Table 1 (Continued)

Common Name	Scientific Name
Galingale	Cyperus sp.
Garden asparagus	Asparagus officinalis
*Grape	Vitis sp.
*Gray birch	Betula populifolia
Great bulrush	Scirpus validus
Green ash	Fraxinus pennsylvanica var.
Groundsel tree	Baccharis halimifolia
*Hackberry	Celtis occidentalis
Halberd-leaved tearthumb	Polygonus arifolium
Hawthorn	Crataegus sp.
Hedge hyssop	Gratiola neglecta
Hedge nettle	Stachys tenuifolia
Hemp vine	Mikania scandens
**High bush blueberry	Vaccinium corymbosum
Horsetail	Equisetum arvense
**Indian grass	Sorgastrum nutans
*Indian hemp	Apocynum cannabinum
**Japanese barberry	Berberis thunbergi
*Japanese honeysuckle	Lonicera japonica
Jewelweed	Impatiens biflora
Joe-Pye weed	Eupatorium maculatum
Jointed charlock	Raphanus raphanistrum
King devil	Hieracium pratense
Lambs quarters	Chenopodium spl
Love grass	Eragrostis pilosa
Marsh cress	Rorippa islandica
Marsh fern	Thelypteris palustris
Marsh mallow	Hibiscus palustris
Marsh skullcap	Scutellaria galericulata
Meadow rue	Thalictrum sp.
Mexican tea	Chenopodium ambrosiodes

(Continued)

Table 1 (Continued)

Common Name	Scientific Name
Mock bishop-weed	Ptilimnium capillaceum
*Multiflora rose	Rosa multiflora
Narrow leaf cattail	Typha angustifolium
Nightshade	Solanum dulcamara
Old fields toadflax	Linaria canadensis
*Oriental bittersweet	Celastrus orbiculatus
*Panic grass	Panicum clandestinum
Path rush	Juncus tenuis
Peppergrass	Lepidium virginicum
Pickerel weed	Pontederia cordata
*Pineweed	Hypericum gentianoides
Plantain	Plantago sp.
*Poison ivy	Rhus radicans
*Pokeweed	Phtolacca americana
Purple loosestrife	Lythrum salicaria
*Quack grass	Agropyron repens
Ragweed	Ambrosia artemisiifolia
*Red ash	Fraxinus pennsylvanica
*Red cedar	Juniperus virginiana
**Red maple	Acer rubrum
*Red top	Agrostis alba
*Reed grass	Phragmites communis
Rough cinquefoil	Potentilla norvegica
*Rough edged goldenrod	Solidago graminifolia
Rush	Juncus acuminatus
Rush	Juncus pelocarpus
Saltmarsh fleabane	Pluchea purpurascens
Salt water cordgrass	Spartina alterniflora
Sand grass	Triplasis purpurea
Sassafras	Sassafras albidium
Sedge	Carex rostrata

(Continued)

Table 1 (Continued)

Common Name	Scientific Name
Sedge	Carex scoparia
Sedge	Carex stipata
*Sedge	Carex spp.
Sedge	Cyperus strigosus
Sea rocket	Cakile edentula
Sensitive fern	Onoclea sensibilis
*Sheep sorrel	Rumex acetosella
**Silky dogwood	Cornus amomum
Silver maple	Acer saccharinum
*Slough grass	Spartina pectinata
Smartweed	Polygonum lapathifolium
*Smooth sumac	Rhus glabra
Sorrel	Oxalis stricta
Spike rush	Eleocharis obtusa
Stinging nettle	Urtica procera
*Staghorn sumac	Rhus typhina
St. Johnswort	Hypericum mutilum
Strawberry	Fragaria sp.
Swamp milkweed	Asclepias incarnata
Swamp white oak	Quercus bicolor
Sweet vernal grass	Anthoxanthium odoratum
*Switchgrass	Panicum virgatum
Sycamore	Platanus occidentalis
Tansy	Tanacetum vulgare
Terrell grass	Elymus virginicus
*Thistle	Cirsium vulgare
Tick-trefoil	Desmodium canadense
*Tree of heaven	Ailanthus altissima
Tuckahoe	Peltandra virginica
Umbrella sedge	Cyperus dentatus
Virginia creeper	Parthenocissus quinquefolia

(Continued)

Table 1 (Concluded)

Common Name	Scientific Name
Water arrowhead	Sagittaria subulata
Water dock	Rumex sp.
Water hemlock	Cicuta maculata
Water hemp	Acnida cannibina
Water horehound	Lycopus americanus
Water parsnip	Berula erecta
Water parsnip	Sium suave
Water smartweed	Polygonum punctatum
Wild bean	Strophostyles helvola
*Wild black cherry	Prunus serotina
Wild lettuce	Lactuca canadensis
Wild rice	Zizania aquatica
*Wild rose	Rosa virginiana
Willow	Salix sp.
Willow-herb	Epilobium hirsutum
*Winged sumac	Rhus copallina
Wood sage	Teucrium canadense
Yarrow	Achillea millefolium
Yellow dock	Rumex acetosella
Yellow iris	Iris pseudoacorus

Note. The plant nomenclature reference used in this report is Gray's Manual of Botany. 8th edition, Fernald 1950.

Table 2

Mammals, Reptiles and Amphibians that May Occur at Nott Island

Mammals

Common Name	Scientific Name
Eastern cottontail rabbit	Sylvilagus floridanus
*Eastern mole	Scalopus aquaticul
Ermine	Mustela erminea
House mouse	Mus musculus
Long-tailed weasel	Mustela frenata
*Meadow jumping mouse	Zapus hudsonicus
*Meadow vole	Microtus pennsylvanicus
Mink	Mustela vison
*Muskrat	Ondatra zibethicus
*Norway rat	Rattus norvegicus
Opossum	Didelphis marsupialis
*Raccoon	Procyon lotor
Red fox	Vulpes vulpes
River otter	Lutra canadensis
*Short-tailed shrew	Blarina brevicauda
Striped skunk	Mephitis mephitis
*White-footed mouse	Peromyscus leucopus
White-tailed deer	Odocoileus virginianus

Reptiles

*Black racer	Coluber constrictor constrictor
*Diamondback terrapin	Malaclemys terrapin terrapin
Eastern box turtle	Terrapene carolina carolina
*Eastern garter snake	Thamnophis sirtalus sirtalus
Eastern hognose snake	Heterodon platyrhinos
Eastern ribbon snake	Thamnophis sauritus sauritus
Eastern worm snake	Carphophis amoenus amoenus

*Noted on island by actual observation or sign

(Continued)

Table 2 (Concluded)

Northern water snake	Natrix sipedon sipedon
*Snapping turtle	Chelydra serpentina
*Spotted turtle	Clemmys cutlata

Amphibians

Common Name	Scientific Name
*American toad	Bufo americanus
*Fowler's toad	Bufo woodhousei fowleri
Eastern spadefoot toad	Scaphiopus holbrooki
Eastern tree frog	Hyla versicolor versicolor
Mudpuppy	Necturus maculosus
Spring pepper	Hyla crucifer

Note. The animal nomenclature reference used in this report is Mammals, Jones et al. 1975. Amphibians and Reptiles, Conant 1975.

Table 3

Preliminary Survey Results for Small Mammals
on Nott Island, September 1974
Trap Grid Capture Results by Biotic Community

	Captures/Biotic Community				
	Beach Grass	False indigo	Panic Grass	Black Locust	Sedge/ Cordgrass
Meadow vole	3	28	28	12	2
Meadow jumping mouse	8	2	3	0	1
White-footed mouse	0	1	1	0	0
Short-tailed shrew	0	0	1	0	0
Total	11	31	33	12	3
Total trap nights	40	45	90	30	25

No captures were made in the unvegetated areas during five nights of trapping.
No traps were placed in the biotic communities labeled elm/vines (bittersweet), alder, or common reed.

Table 4

Results of the Small Mammal Trapping Survey of Nott Island, Summer 1975

	Habitat	No. Traps	No. Trap Nights	Captures[2] Microtus	%	Zapus	%	Rattus	%
AREA I	Disposal Site								
	M/T/S[3]	3	6	1	17	-	-	-	-
	S	33	71	1	1	11	16	-	-
	G	48	102	1	1	10	10	-	-
	G/S	16	33	1	3	5	15	-	-
	DS	9	18	-	-	-	-	-	-
	U	119	239	-	-	-	-	-	-
	RD	6	13	-	-	-		-	-
	Total	234	482	4	32	26	41		
AREA II	North Area								
	M/T/S	14	98	1	1	-	-	-	-
	S	39	273	19	7	2	1	-	-
	G	20	140	20	14	1	1	-	-
	G/S	31	217	49	23	10	5	-	-
	FW	4	28	5	18	3	11	-	-
	Total	108	756	94	63	16	18		
AREA III	Southwest Area								
	EW	5	20	-	-	-	-	-	-
	S	26	104	8	8	2	19	1	1
	G	14	56	10	18	7	13	-	-
	G/S	25	100	11	11	11	11	-	-
	Total	70	280	29	37	20	43	1	1
AREA IV	Southeast Area								
	M/T/S	2	11	-	-	-	-	-	-
	S	28	133	2	15	-	-	-	-
	G	18	114	19	17	14	12	1	1
	G/S	30	162	15	9	2	12	2	1
	Total	78	429	36	41	16	24	3	2
	TOTAL	490	1938	163	173	78	126	4	3

[1] "%" = percent animals captured per trapnight for that habitat.

[2] Numbers of mice and rats captured include recaptures.

[3] Key to habitats:

M/T/S - Mixed tree shrubland
S - Shrubland
G - Grassland
G/S - Grass shrubland
FW - Freshwater wetland
EW - Estuarine wetlands
DS - Disposal site
RD - Recently disturbed area
U - Unvegetated

APPENDIX A': BIRDS OF NOTT ISLAND

PART I: A PROJECTED AVIFAUNA OF NOTT ISLAND

1. For purposes of bird habitat, Nott Island may be divided into three regions: (a) the marshy area of the south end, (b) the scrub, grassland, and sand area of the north end, and (c) the mudflats and open water about the periphery of the island. These areas offer much suitable habitat for birds. Breeding birds will be considered first, then the transient birds will be discussed.

Breeding Birds of the Marsh

2. The marsh area consists primarily of cattail and reed grass, both of which are tall plants. Thus, birds preferring a short-vegetation marsh may be scarse. The water of the marsh is brackish, thereby limiting marsh birds that are confined to fresh-water or salt-water habitats. Given these conditions, five species of waterfowl might be expected to nest in the marsh: mute swan, Canada goose, mallard, black duck, and gadwall (Pough 1951, Burt 1974). Other possible nesting marsh birds include American bittern, least bittern, sora, Virginia rail, and king rail (Pough 1951, Burt 1974). Songbirds that might nest in the marsh are long-billed marsh wren, yellowthroat, redwinged blackbird, and swamp sparrow (Pough 1949, Burt 1974). Fresh-water marsh birds, such as blue-winged teal, pied-billed grebe, and common gallinule, are not expected (Pough 1951), nor are such salt-water species as clapper rail, sharp-tailed sparrow, and seaside sparrow (Pough 1949 and 1951) (Table A1).

Waterfowl

3. The mute swan is an introduced species which has been rapidly increasing in the southeastern part of Connecticut for the past fifteen years (Peterson 1947, Robbins et al. 1966). It nests in marshy areas and is constantly observed in the Connecticut River adjacent to Nott Island. No

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NOTE: Part I of Appendix A was prepared by Gregory Butcher

nests have yet been discovered on the island. The Canada goose normally breeds far north of Connecticut (Newfoundland, occasionally south to Massachusetts)(A.O.U. Checklist 1957), but two active nests were discovered in the marsh and a third is suspected. The mallard and black duck are common marsh-nesting birds in southern New England (Burt 1974). Two mallard nests have been discovered on Nott Island. No black duck nests have been seen, although black ducks are consistently observed about the island. The gadwall population is steadily increasing in southern New England (Pough 1951, Burt 1974), but no evidence of its nesting on Nott Island has been discovered.

Wading birds

4. Of the five bitterns and rails listed, only one (American bittern) has been seen in the marsh. . The secretive habits of bitterns and rails and the density of the marsh vegetation both lessen the chances of observing these birds. Thus, it remains a strong possibility that any of the five might breed on the island.

Songbirds

5. Long-billed marsh wren, redwinged blackbird, and yellowthroat are all abundant nesters in the marsh area. The swamp sparrow, a secretive species (Pough 1949), has yet to be observed.

Breeding Birds of the Upland

6. The upland areas of the island provide three primary habitats for breeding birds: (a) open, sandy areas; (b) grasslands; and (c) scrub. Of these, the scrub is the most important habitat since few nesting birds in this area are attracted to sand or grassland (Table A2).

Sand

7. The killdeer, bank swallow, and rough-winged swallow are the only species that might be expected to nest on the open, sandy areas of the island (Pough 1949). The killdeer and the bank swallow are both consistently observed on the island, but there is no evidence of nesting for these species. Both swallows require a sandy bank for a nesting site; the killdeer nests on the flat ground (Pough 1949 and 1951).

Grassland

8. The spotted sandpiper and the Savannah sparrow are both expected nesters in the dunegrass areas of the island (Pough 1949 and 1951). The spotted sandpiper has provided ample evidence of nesting, with an estimated three pairs, but the Savannah sparrow has yet to be observed on the island.

Scrubs

9. Hawks and owls. A total of nine raptors are possible breeders on Nott Island, although no evidence of their nesting has been found. The kestrel would be the most likely of the nine to breed (Pough 1951); the osprey might well nest on the island if a high platform were provided. The high level of human use of the island probably deters the nesting of the turkey vulture. These three species mentioned above are the most common raptors observed on the island in the summer months. The marsh hawk, short-eared owl, and barn owl might all be attracted to the open country of the island; however, both the marsh hawk and the short-eared owl are rare in this area during the summer months (Burt 1974). The barn owl is rare throughout the year. Of the three, only the marsh hawk has been observed on the island. The red-tailed hawk, the great horned owl, and the screech owl are all possible nesters on the island, but the lack of a forest habitat may deter them (Pough 1949 and 1951).

10. Other non-passerines. There are eight other species of non-passerine birds that might be expected to nest in the scrub areas of the island: bobwhite, ring-necked pheasant, American woodcock, mourning dove, yellow-billed cuckoo, black-billed cuckoo, common flicker, and downy woodpecker (Pough 1949 and 1951). The bobwhite and ring-necked pheasant would be attracted to the scrubby grassland edges (Johnsgard 1973); the mourning dove to brushy areas (Pough 1951); the woodcock to the alder thicket or to the scrub-marsh edge (Pough 1951); and the cuckoos and woodpeckers to the trees scattered about the scrub (Pough 1949). Of the eight species, three provide positive evidence of breeding: bobwhite, mourning dove, and common flicker. Three others--ring-necked pheasant, yellow-billed cuckoo, and downy woodpecker--have been observed and may breed. Only the woodcock and the black-billed cuckoo remain unrecorded.

11. Songbirds. The scrub areas of the island seem to offer suitable habitat for about 36 species of songbirds. If a forest habitat were present on the island, the list of expected species might be double that number; some flycatchers, some wrens, some thrushes, most vireos, many warblers, the orioles, and the tanagers would not be expected because of the absence of the forest habitat. Of the 36 species that might be expected to occur in the scrub habitat, 19 have been seen on the island and 15 have provided positive evidence of nesting. The expected songbirds belong to the following families: flycatchers (three species), jays and crows (three species), chickadees (one species), mimics (three species), thrushes (two species), waxwings (one species), shrikes (one species), starlings (one species), and finches and sparrows (ten species).

12. The biggest surprise on Nott Island has been the lack of diversity of warbler and vireo species. Although eight species might reasonably be expected, only two have actually been recorded--the yellow warbler and the yellowthroat. The yellow warbler is found in the woodland scrub and dense scrub areas; the yellowthroat, in scrub-grass edges and in the marsh. Chestnut-sided, prairie, and blue-winged warblers and white-eyed vireos all might be expected to occur commonly on the island. They prefer scrub habitats (Plough 1949, Peterson 1947) and commonly nest in adjacent areas of southeastern Connecticut (Burt 1974, Robbins et al. 1966). The Nashville warbler and the yellow-breasted chat are less common in adjacent areas (Peterson 1947), but could reasonably be expected in small numbers (Burt 1974). The two most probable hypotheses for the lack of diversity of warbler and vireo species are as follows: (a) the small size of the island favors the establishment of large populations of a small number of species, and (b) the lack of a forest habitat eliminates the edge environment which may be important in supporting a diversity of scrub species.

Transient Species of the Uplands

13. In addition to the birds which may be expected to breed on Nott Island, a number of species can be expected to occur there as transients (Table A3). Summer transients are birds for whom the island does not provide proper nesting habitat but does provide good feeding habitat. Winter transients are birds that nest farther north and that migrate south to spend the winter in Connecticut. Spring and fall transients are birds that nest farther north and winter farther south, but that might be expected to stop on Nott Island during their migration. Year-round transients are birds that are not expected to breed on the island, but that might visit it to feed during any month of the year. Expected breeding birds that might also remain on the island throughout the year are indicated permanent residents in (*) in Tables A1 and A2. Breeding birds, summer transients, and winter transients all are also expected as spring and fall transients. The Connecticut River is an important route for migrating birds (Burt 1974), with the fall migration being much more important than the spring migration. Hawks, shorebirds, and songbirds all should be well represented during the autumn migration. During migration, birds often rest in habitats that are much different from their normal locations; however, only the birds that would normally be expected in the habitats present on Nott Island are listed in the accompanying tables.

Raptors

14. Hawks and Owls. The abundant rodent population and the presence of roost trees encourages transient raptors to use the island. The sharp-shinned hawk, red-shouldered hawk, long-eared owl, and barred owl all might be expected during any month of the year. The broad-winged hawk is a possible summer visitor, while the bald eagle, rough-legged hawk, goshawk, and snowy owl are possible winter visitors. The autumn hawk migration is a prominent event in southern New England, and the Connecticut River is an expected route for that migration (Burt 1974). In addition to all the above-mentioned hawks (possible nesters and transients), the cooper's hawk, the peregrine falcon, and the merlin may be expected to occur on the island in fall.

Other

15. Non-passerines. There are only six other non-passerines that may be expected to occur on Nott Island as transients. The rock dove and the belted kingfisher may be expected during any month of the year; indeed, both are commonly encountered on the island. The whip-poor-will, common nighthawk, chimney swift, and ruby-throated hummingbird may be expected as summer transients.

16. Songbirds. Nott Island may be expected to be an important resting area for migrating songbirds, especially in the fall. Flycatchers, thrushes, kinglets, pipits, vireos, warblers, and sparrows that nest farther north may be expected to stop on the island in migration. Swallows--barn swallow, tree swallow, and purple martin--are important summer transients, while the family of finches and sparrows should be especially well represented as winter transients.

Transient Species of the Marsh, Mudflats, and Open Water

17. The wetlands areas of Nott Island provide important resting and feeding areas for many species of transient birds. Herons, gulls, and terns are all attracted to the island in the summer; ducks and other water birds in the winter. The island's mudflats attract many shorebirds in migration (Table A4).

Waterbirds

18. Twelve species of ducks, in addition to those that are permanent residents, may be expected to winter on or near Nott Island. Four more species of ducks and the snow goose may be expected in migration. In addition, two species each of loons and grebes and the American coot may be expected to winter in the vicinity of the island. The double-crested cormorant is a winter visitor.

Herons

19. The herons (nine species) are important summer visitors to Nott Island. Many of them have nesting rookeries near the island, while others are post-breeding or non-breeding visitors to the island. Two of the species--great blue heron and black-crowned night heron--can be expected to visit year-round.

Shorebirds

20. The shorebird migration is expected to be an important fall event on the island. The spring shorebird migration occurs mainly in May, but the fall migration lasts from July through November. More than 20 species may be expected to occur on the island during the migration, most of them appearing on the mudflats during low tide.

Gulls and terns

21. Gulls and terns are important visitors to the island throughout the year. The great black-backed gull and the Herring gull are year-round visitors. The ring-billed gull and the Bonaparte's gull are expected winter visitors, while the laughing gull, the common tern, the least tern, and the black skimmer are all possible summer visitors. The Forster's, caspian, and black terns may all occur during migration.

PART II: BREEDING BIRD POPULATION STUDY

22. For purposes of this discussion, the island, which is approximately 77.1 acres in area at high tide, was split into two tracts: Tract A, including all upland areas, with an area of 58 acres, and Tract B, comprising reed grass and cattail marshes, with a size of 21 acres.

Breeding Birds

23. The breeding bird population of Nott Island consisted of 146 nesting pairs belonging to 23 species. Density of breeding birds over the entire island was 1187/sq mi. The most common nesting species were: red-winged blackbird, 25 pairs; song sparrow, 19 pairs; yellow warbler, 17; long-billed marsh wren, 15; yellowthroat, 14; and catbird, 10.

24. For the discussion of Tracts A and B, the number of breeding pairs is listed after the species name. The number in the parenthesis refers to density in terms of number per square mile for species with 3 or more breeding pairs.

25. Tract A. 92 pairs comprising 18 species bred in Tract A; total breeding bird density for the tract was 1022 pairs/sq mi. Nesting species consisted of: yellow warbler, 17 (189), upland scrub; song sparrow, 13 (144), throughout; yellowthroat, 12 (133), marsh and scrub edges; catbird, 10 (111), woodland scrub; bobwhite, 6 (67), scrub edge; willow flycatcher, 5 (56), woodland scrub; spotted sandpiper, 3 (33), grassland; mourning dove, 3 (33), scrub; starling, 3 (33), dead elm; purple finch, 3 (33), woodland scrub; common flicker, 2, dead tree; eastern kingbird, 2, scrub edge; mockingbird, 2, scrub; cardinal, 2, scrub; house finch, scrub; blue jay, 1, woodland scrub; and black-capped chicadee, 1, woodland scrub.

26. Tract B. 54 nesting pairs totalling 7 species bred in the marsh areas of Nott Island; total breeding bird density for Tract B was 1636 pairs/sq mi. Nesting species consisted of: red-winged blackbird, 25 (758), marsh; long-billed marsh wren, 15 (455), marsh; song sparrow, 6 (182), throughout; Canada goose, 3 (91), marsh, atop muskrat lodges;

mallard, 2, marsh; yellowthroat, 2, marsh edge; swamp sparrow, 1, reed grass. The number of breeding pairs of Canada geese and mallards may be less than indicated; one brood for each species was observed considerably later than the rest, and may have been second broods.

Table A1

Breeding Birds of the Marsh

Expected	Observed	Nesting Evidence
Non-Passerine		
Waterfowl		
Mute swan*	X	
Canada goose	X	X
Mallard	X	X
Black duck	X	
Gadwall		
Wading Birds		
American bittern	X	
Least bittern		
Sora		
Virginia rail		
King rail		
Passerine (Songbirds)		
Long-billed marsh wren	X	X
Yellowthroat	X	X
Redwinged blackbird	X	X
Swamp sparrow		

* Permanent resident in southern New England.

Table A2

Breeding Birds of the Upland

Expected	Observed	Nesting Evidence
Sand		
Killdeer*	X	
Bank swallow	X	
Rough-winged swallow		
Grassland		
Spotted sandpiper	X	X
Savannah sparrow		
Scrub		
Non-Passerine (Waterbirds & Larger Upland Birds)		
Bobwhite	X	X
Ring-necked pheasant	X	X
American woodcock		
Mourning dove	X	X
Yellow-billed cuckoo	X	
Black-billed cuckoo		
Common flicker	X	X
Downy woodpecker	X	
Passerine (Songbirds)		
Eastern kingbird	X	X
Willow flycatcher	X	X
Least flycatcher		
Blue jay	X	X
Common crow	X	
Fish crow		
Black-capped chickadee	X	X
Mockingbird	X	X
Catbird	X	X
Brown thrasher		
American robin	X	
Eastern bluebird		
Cedar waxwing		
Loggerhead shrike		
Starling	X	X
White-eyed vireo		
Blue-winged warbler		
Nashville warbler		
Yellow warbler	X	X
Chestnut-sided warbler		

(Continued)

Table A2 (Concluded)

Expected	Observed	Nesting Evidence
Passerine (cont.)		
Prairie warbler		
Yellowthroat	X	X
Yellow-breasted chat		
Baltimore oriole	X	
Common grackle	X	
Brown-headed cowbird		
Cardinal	X	X
Indigo bunting		
Purple finch	X	X
House finch	X	X
American goldfinch	X	X
Rufous-sided towhee		
Chipping sparrow	X	X
Field sparrow		
Song sparrow	X	X
Other Non-Passerines (Hawks & Owls)		
Kestrel	X	
Osprey	X	
Turkey vulture	X	
Marsh hawk	X	
Red-tailed hawk		
Screech owl		
Great horned owl		
Short-eared owl		
Barn owl		

* Permanent resident in southeastern Connecticut.

Table A3

Transient Species of the Uplands

Expected	Observed
Raptors	
Year-Round	
Sharp-shinned hawk	
Red-shouldered hawk	
Long-eared owl	
Barred owl	
Summer	
Broad-winged hawk	
Winter	
Bald eagle	
Rough-legged hawk	
Goshawk	
Snowy owl	
Spring/Fall	
Cooper's hawk	
Peregrine falcon	
Merlin	
Other Non-Passerines	
Year-Round	
Rock dove	X
Belted kingfisher	X
Summer	
Whip-poor-will	
Common nighthawk	
Chimney swift	
Ruby-throated hummingbird	
Songbirds	
Summer	
Tree swallow	X
Barn swallow	X
Purple martin	

(Continued)

Table A3 (Concluded)

Expected	Observed
Songbirds (cont.)	
Winter	
Horned lark	
Northern shrike	
Common redpoll	
Pine siskin	
Dark-eyed junco	
Tree sparrow	
White-throated sparrow	
Lapland longspur	
Snow bunting	
Spring/Fall	
Alder flycatcher	X
Hermit thrush	
Veery	
Ruby-crowned kinglet	
Golden-crowned kinglet	
Water pipit	
Philadelphia vireo	
Orange-crowned warbler	
Wilson's warbler	
White-crowned sparrow	
Fox sparrow	
Lincoln's sparrow	

Table A4

Transient Species of the Wetlands

Expected	Observed
Year-Round	
Double-crested cormorant	X
Great blue heron	
Black-crowned night heron	X
Great black-backed gull	X
Herring gull	X
Summer	
Great egret	X
Snowy egret	X
Louisiana heron	
Little blue heron	
Green heron	X
Yellow-crowned night heron	
Glossy ibis	
Laughing gull	X
Common tern	X
Least tern	X
Black skimmer	
Winter	
Common loon	
Red-throated loon	
Red-necked grebe	
Horned grebe	
Great cormorant	
Green-winged teal	X
American wigeon	
Redhead	
Canvasback	
Greater Scaup	
Lesser Scaup	
Common goldeneye	
Barrow's goldeneye	
Bufflehead	
Hooded merganser	
Common merganser	X
Red-breaster merganser	
American coot	
Ring-billed gull	
Bonaparte's gull	

(Continued)

Table A4 (Concluded)

Expected	Observed
Spring/Fall	
Snow goose	
Pintail	
Northern shoveller	
Ring-necked duck	
Ruddy duck	X
Semipalmated plover	
Ruddy turnstone	
Black-bellied plover	
Common snipe	
Whimbrel	
Solitary sandpiper	
Greater yellowlegs	X
Lesser yellowlegs	X
Pectoral sandpiper	
White-rumped sandpiper	
Baird's sandpiper	
Least sandpiper	X
Semipalmated sandpiper	
Dunlin	
Short-billed dowitcher	X
Long-billed dowitcher	
Stilt sandpiper	
Western sandpiper	
Marbled godwit	
Hudsonian godwit	
Sanderling	
Forster's tern	
Caspian tern	
Black tern	

In accordance with letter from DAEN-RDC, DAEN-ASI dated 22 July 1977, Subject: Facsimile Catalog Cards for Laboratory Technical Publications, a facsimile catalog card in Library of Congress MARC format is reproduced below.

Warren, R Scott
Habitat development field investigations, Nott Island upland habitat development site, Connecticut River, Connecticut; Appendix A: Preliminary terrestrial ecological survey / by R. Scott Warren, W. A. Niering, Connecticut College, New London, Connecticut. Vicksburg, Miss. : U. S. Waterways Experiment Station ; Springfield, Va. : available from National Technical Information Service, 1978.
34, 16 p. : ill. ; 27 cm. (Technical report - U. S. Army Engineer Waterways Experiment Station ; D-78-25, Appendix A)
Prepared for Office, Chief of Engineers, U. S. Army, Washington, D. C., under Contract No. DACW33-75-M-0059 (DMRP Work Unit No. 4B04A)
Literature cited: p. 19-22.

1. Ecology. 2. Field investigations. 3. Habitat development. 4. Habitats. 5. Nott Island, Conn. 6. Terrestrial habitats. 7. Vegetation. I. Niering, W. A., joint author. II. Connecticut College. III. United States. Army. Corps of Engineers. IV. Series: United States. Waterways Experiment Station, Vicksburg, Miss. Technical report ; D-78-25, Appendix A.
TA7.W34 no.D-78-25 Appendix A